

## MATERIAL SAFETY DATA SHEET

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Version 1.15

## Section 1 - Product and Company Information

Product Name ACETIC ACID, 99.7+%, A.C.S. REAGENT  
(POLY-COATED BOTTLES)  
Product Number 320099  
Brand SIAL  
Company Sigma-Aldrich  
Address 3050 Spruce Street  
SAINT LOUIS MO 63103 US  
Technical Phone: 800-325-5832  
Fax: 800-325-5052  
Emergency Phone: 314-776-6555

## Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
ACETIC ACID	64-19-7	No

Formula C2H4O2  
Synonyms Acetic acid (ACGIH:OSHA) \* Acetic acid, glacial \*  
Acide acetique (French) \* Acido acetico (Italian)  
\* Azijnzuur (Dutch) \* Essigsaeure (German) \*  
Ethanoic acid \* Ethylic acid \* Glacial acetic  
acid \* Kyselina octova (Czech) \*  
Methanecarboxylic acid \* Octowy kwas (Polish) \*  
Vinegar acid  
RTECS Number: AF1225000

## Section 3 - Hazards Identification

## EMERGENCY OVERVIEW

Combustible (USA) Flammable (EU). Corrosive.  
Causes severe burns. Harmful in contact with skin.  
Lachrymator. Target organ(s): Teeth. Kidneys.

## HMIS RATING

HEALTH: 3\*  
FLAMMABILITY: 2  
REACTIVITY: 1

## NFPA RATING

HEALTH: 3  
FLAMMABILITY: 2  
REACTIVITY: 1

\*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

## Section 4 - First Aid Measures

## ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician. Do not induce vomiting.

#### INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

#### DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

#### EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

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### Section 5 - Fire Fighting Measures

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#### FLASH POINT

104 °F    40 °C    Method: closed cup

#### EXPLOSION LIMITS

Lower: 4 %    Upper: 19.9 %

#### AUTOIGNITION TEMP

427 °C

#### FLAMMABILITY

N/A

#### EXTINGUISHING MEDIA

Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

#### FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.  
Specific Hazard(s): Combustible liquid. Emits toxic fumes under fire conditions.

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### Section 6 - Accidental Release Measures

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#### PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area.

#### PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

#### METHODS FOR CLEANING UP

Cover with dry lime or soda ash, pick up, keep in a closed container, and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

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### Section 7 - Handling and Storage

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#### HANDLING

User Exposure: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

#### STORAGE

Suitable: Keep tightly closed. Keep away from heat and open flame.

SPECIAL REQUIREMENTS  
Moisture sensitive.

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## Section 8 - Exposure Controls / PPE

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### ENGINEERING CONTROLS

Safety shower and eye bath. Use only in a chemical fume hood.

### PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.  
Hand: Compatible chemical-resistant gloves.  
Eye: Chemical safety goggles.  
Other: Faceshield (8-inch minimum).

### GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

### EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	STEL	15 PPM
USA	ACGIH	TWA	10 PPM
USA	MSHA Standard-air	TWA	10 PPM (25 MG/M3)
USA	OSHA.	PEL	8H TWA 10 PPM (25 MG/M3)
New Zealand OEL			
Remarks: check ACGIH TLV			
USA	NIOSH	TWA	10 PPM
		STEL	15 PPM

### EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	15 MG/M3
Poland		NDSch	30 MG/M3
Poland		NDSP	-

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## Section 9 - Physical/Chemical Properties

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Appearance	Physical State: Liquid Color: Colorless	
Property	Value	At Temperature or Pressure
Molecular Weight	60.05 AMU	
pH	2.4	Concentration: 60.05 g/l
BP/BP Range	117.0 - 118.0 °C	760 mmHg
MP/MP Range	16.2 °C	
Freezing Point	16.7 °C	
Vapor Pressure	11.4 mmHg	20 °C
Vapor Density	2.07 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	1.049 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	

Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	28.8 mN/m	10 °C
Partition Coefficient	Log Kow: - 0.170	
Decomposition Temp.	N/A	
Flash Point	104 °F 40 °C	Method: closed cup
Explosion Limits	Lower: 4 %	
	Upper: 19.9 %	
Flammability	N/A	
Autoignition Temp	427 °C	
Refractive Index	1.3715	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water: Miscible.	
	Other Solvents: GLYCEROL, ACETONE, BENZENE	
	MISCIBLE WITH ALCOHOL, E	

N/A = not available

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## Section 10 - Stability and Reactivity

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### STABILITY

Stable: Stable.

Conditions to Avoid: Moisture.

Materials to Avoid: Oxidizing agents, Soluble carbonates and phosphates, Hydroxides, Oxides, Metals, Peroxides, Permanganates, Amines, Alcohols.

### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

### HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

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## Section 11 - Toxicological Information

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### ROUTE OF EXPOSURE

Skin Contact: Causes burns.

Skin Absorption: Harmful if absorbed through skin.

Eye Contact: Causes burns.

Inhalation: May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

Ingestion: May be harmful if swallowed.

### TARGET ORGAN(S) OR SYSTEM(S)

Teeth. Kidneys.

### SIGNS AND SYMPTOMS OF EXPOSURE

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema.

Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Ingestion or inhalation of concentrated acetic acid causes damage to tissues of the respiratory and digestive tracts. Symptoms include: hematemesis, bloody diarrhea, edema

and/or perforation of the esophagus and pylorus, hematuria, anuria, uremia, albuminuria, hemolysis, convulsions, bronchitis, pulmonary edema, pneumonia, cardiovascular collapse, shock, and death. Direct contact or exposure to high concentrations of vapor with skin or eyes can cause: erythema, blisters, tissue destruction with slow healing, skin blackening, hyperkeratosis, fissures, corneal erosion, opacification, iritis, conjunctivitis, and possible blindness. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

#### CONDITIONS AGGRAVATED BY EXPOSURE

Severe, acute pancreatitis may occur after ingestion of concentrated acetic acid.

#### TOXICITY DATA

Oral  
Rat  
3310 mg/kg  
LD50

Inhalation  
Mouse  
5,620 ppm  
LC50

Remarks: Blood:Other changes. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Other. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Conjunctive irritation.

Intravenous  
Mouse  
525 MG/KG  
LD50

Remarks: Behavioral:Convulsions or effect on seizure threshold.

Skin  
Rabbit  
1060 UL/KG  
LD50

#### IRRITATION DATA

Skin  
Human  
50 mg  
24H  
Remarks: Mild irritation effect

Skin  
Rabbit  
525 mg  
Remarks: Open irritation test

Skin  
Rabbit  
50 mg  
24H  
Remarks: Mild irritation effect

Eyes  
Rabbit

5 mg  
30S  
Remarks: Rinsed

#### CHRONIC EXPOSURE - MUTAGEN

Species: Human  
Dose: 5 MMOL/L  
Cell Type: lymphocyte  
Mutation test: Sister chromatid exchange

Species: Mouse  
Route: Skin  
Dose: 79279 UG/KG  
Mutation test: Unscheduled DNA synthesis

Species: Mouse  
Route: Skin  
Dose: 1201 MG/KG  
Mutation test: Other mutation test systems

Species: Hamster  
Dose: 10 MMOL/L  
Cell Type: ovary  
Mutation test: Cytogenetic analysis

#### CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat  
Dose: 700 MG/KG  
Route of Application: Oral  
Exposure Time: (18D POST)  
Result: Effects on Newborn: Behavioral.

Species: Rat  
Dose: 400 MG/KG  
Route of Application: Intratesticular  
Exposure Time: (1D MALE)  
Result: Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).

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#### Section 12 - Ecological Information

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##### ACUTE ECOTOXICITY TESTS

Test Type: EC50 Algae  
Time: 24 h  
Value: 156 mg/l

Test Type: EC50 Daphnia  
Species: Daphnia magna  
Time: 48 h  
Value: 65 mg/l

Test Type: LC50 Fish  
Species: Leuciscus idus  
Time: 48 h  
Value: 410 mg/l

Test Type: LC50 Fish  
Species: Cyprinus carpio

Time: 48 h  
Value: 49 mg/l

Test Type: LC50 Fish  
Species: Pimephales promelas (Fathead minnow)  
Time: 96 h  
Value: 79.0 - 88.0 mg/l

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### Section 13 - Disposal Considerations

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#### APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

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### Section 14 - Transport Information

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#### DOT

Proper Shipping Name: Acetic acid, glacial [or] Acetic acid solution, [with more than 80 percent acid, by mass]  
UN#: 2789  
Class: 8  
Packing Group: Packing Group II  
Hazard Label: Corrosive  
Hazard Label: Flammable liquid  
PIH: Not PIH

#### IATA

Proper Shipping Name: Acetic acid, glacial  
IATA UN Number: 2789  
Hazard Class: 8  
Packing Group: II

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### Section 15 - Regulatory Information

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#### EU DIRECTIVES CLASSIFICATION

Symbol of Danger: C  
Indication of Danger: Corrosive.  
R: 10-35  
Risk Statements: Flammable. Causes severe burns.  
S: 23-26-45  
Safety Statements: Do not breathe vapor. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

#### US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Combustible (USA) Flammable (EU).  
Corrosive.  
Risk Statements: Causes severe burns. Harmful in contact with skin.  
Safety Statements: Keep away from sources of ignition - no smoking. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection.  
US Statements: Lachrymator. Target organ(s): Teeth. Kidneys.

#### UNITED STATES REGULATORY INFORMATION

SARA LISTED: No

TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

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Section 16 - Other Information

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DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2006 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.